CLAIMS

1. A composition for controlled temperature induction heating comprising at least one matrix material and ferromagnetic hexagonal ferrite particles, and wherein the particles have a specific Curie temperature (Tc) in the matrix material.

2. The composition of claim 1, wherein the ferromagnetic hexagonal ferrite particles comprise SrF, Mea-2W, Mea-2Y, and Mea-2Z, wherein 2W is BaO:2MeaO:8Fe2O3, 2Y is 2(BaO:MeaO:Fe203), and 2Z is 3BaO:2MeaO: 12Fe2O3, and wherein Mea is a divalent cation.

3. The composition of claim 2, wherein the divalent cation is selected from Mg, Co, Mn and Zn.

4. The composition of claim 2, wherein the ferromagnetic hexagonal ferrite particles have the SrFe12O19, Co-2Y, Mg-2Y, Zn/Co-2Y, or Zn/Mg-2Y or combinations thereof.

5. The composition of claim 1, wherein the particles are on a surface of the matrix material.

6. The composition of claim 1, wherein the particles are embedded in the matrix material.

7. The composition of claim 1, wherein the Curie temperature is from about 100° to 450°C.

8. The composition of claim 1, wherein the particles are from about 1 micron to about 840 microns.

9. The composition of claim 1, wherein the particles are less than 1 micron.

10. The composition of claim 1, wherein the particles are present from about 1% to about 50% by volume.

11. The composition of claim 11, wherein the particles are from about 10% to about 30% by volume.

12. The composition of claim 11, wherein the particles are present from about 15% to about 20% by volume.

13. The composition of claim 1, wherein the matrix material comprises a thermoplastic material.

14. The composition of claim 13, wherein the thermoplastic material comprises PEEK, PEKK, PEI, PPS, PSU, PET, polyester, PA, PP, PP/MXD6, PP/EVOH, PE, PU, PPO, PC or combinations thereof.

15. The composition of claim 1, wherein Tc of the particles is less than the melting temperature of the matrix material.

16. The composition of claim 1, wherein Tc of the particles is greater than the melting temperature of the matrix material.

17. A composition for controlled temperature induction comprising a matrix material and magnetically soft ferrite particles, wherein the particles have a specific Curie temperature (Tc) in the matrix material.

18. The composition of claim 17, wherein the particles have the composition lMebO: 1Fe2O3, where MebO is a transition metal oxide.

19. The composition of claim 18, wherein the Meb is selected from Ni, Co, Mn, and Zn.

20. The composition of claim 18, wherein the matrix material comprises a thermoplastic material.

21. The composition of claim 20, wherein the thermoplastic material comprises PEEK, PEKK, PEI, PPS, PSU, PET, polyester, PA, PP, PP, PE, PU, PPO, PC or combinations thereof.

22. The composition of claim 17, wherein Tc of the particles is less than the melting temperature of the matrix material.

23. The composition of claim 17, wherein Tc of the particles is greater than the melting temperature of the matrix material.

24. The composition of claim 17, wherein the particles are selected from (Mn, ZnO) Fe203 and (Ni, ZnO)Fe203.

25-72. Cancelled

74. A susceptor for inclusion in a matrix for heating the matrix to a desired Curie temperature comprising a ferromagnetic hexagonal ferrite particle having the composition SrF, Mea-2W, Mea-2Y, and Mea2Z, wherein 2W is BaO:2MeaO:8Fe2O3, 2Y is 2(BaO:MeaO:Fe203), and 2Z is 3BaO:2MeaO: 12Fe2O3, and wherein Mea is a divalent cation, or magnetically soft ferrite particles having the composition 1MebO: 1Fe2O3, where MebO is a transition metal oxide.

75. The susceptor of claim 74, wherein the Curie temperature is changed by varying proportions of zinc in the composition.

76. The susceptor of claim 74, wherein Mea comprises Mg, Co, Mn or Zn and Meb comprises Ni, Co, Mn, or Zn.

77. The susceptor of claim 74, wherein the particles comprise SrF, Co-2Y, Mg-2Y, Zn/Co-2Y, or Zn/Mg-2Y or combinations thereof, (Mn, ZnO)Fe203 or (Ni, ZnO)Fe203.

78. A composite comprising a matrix and a susceptor included in the matrix for heating the matrix to a desired Curie temperature, wherein the susceptor comprises ferromagnetic, hexagonal ferrite particles having the composition SrF, Mea-2W, Mea-2Y, and Mea-2Z, wherein 2W is BaO:2MeaO:8Fe2O3, 2Y is 2(BaO:MeaO:Fe203), and 2Z is 3BaO:2MeaO: 12Fe2O3, and wherein Mea is a divalent cation, or magnetically soft ferrite particles having the composition lMebO: 1Fe2O3, where MebO is a transition metal oxide.

79. The composite of claim 78, wherein the Curie temperature is changed by varying proportions of zinc in the composite.

80. The composite of claim 78, wherein the matrix comprises a thermoplastic material.

81. The composite of claim 80, wherein the thermoplastic material comprises PEEK, PEKK, PEI, PPS, PSU, PET, polyester, PA, PP, PE, PU, PPO, PC, or combinations thereof.

82. The composite of claim 78, wherein Mea comprises Mg, Co, Mn or Zn and Meb comprises Ni, Co, Mn, or Zn.

83-101. Cancelled